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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
TOLEDO, FERNANDO L	
ART UNIT	**PAPER NUMBER**
2823	

DATE MAILED: 06/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/805,911	WEIMER ET AL.
	Examiner	Art Unit
	Fernando L. Toledo	2823

-- The MAILING DATE of this communication appears on the cover sheet with the corresp ndence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 March 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14,17-33,35-48 and 51-56* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14,17-33,35-48 and 51-56* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1 – 8, 11, 10, 13, 14, 17 – 24, 26, 27, 29 – 33, 35 – 43, 45, 46, 48, 49 and 51 – 56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang et al. (U. S. patent 5,607,874) in view of Yamazaki et al. (U. S. patent 5,840,600).

In re claims 1, 21 and 40; Wang discloses in the U. S. patent 5,607,874; figures 1 – 9 and related text, forming several gate stacks over a substrate (10), each of the gate stacks include a gate oxide layer (11) and a conductive layer (16); forming spacers (20) on sidewalls of each of the several gate stacks; forming a source/drain region (12 and 8) in the substrate on opposite sides of the gate stack structure; forming a composite barrier layer over the source/drain regions (8 and 12), the composite barrier layer includes an oxide layer (22) and a barrier layer (24) over the oxide layer; forming a glass insulating layer (30) over the composite barrier layer; forming an opening (42) in the glass insulating layer and the composite barrier layer to expose at least a portion of the upper surfaces of the source/drain regions; and forming a conductor 48 in the opening.

Wang does not teach wherein the oxide layer is formed by oxidizing the upper surface of the source/drain region using atomic oxygen.

However, Yamazaki discloses forming an oxide layer by oxidizing the upper surface of the source/drain region using atomic oxygen (Column 12, Lines 14 – 27).

It would have been within the scope of one of ordinary skill in the art to combine the teachings of Wang and Yamazaki to enable forming the oxide layer 22 of Wang to be performed according to the teachings of Yamazaki because one of ordinary skill in the art would have been motivated to look at alternative suitable methods of performing the disclosed formation of layer 22 of Wang and art recognized suitability for an intended purpose has been recognized to be motivation to combine. MPEP 2144.07.

Wang in view of Yamazaki does not teach wherein the oxide layer is formed to a thickness of about 50 Å to about 100 Å.

However, thickness is a well known process variable and it would have been obvious to one of ordinary skill at the time the invention was made to form the oxide to a thickness of about 50 Å to about 100 Å, since determining the optimum or workable ranges requires routine experimentation by someone of ordinary skill in the art. Note that the specification contains no disclosure of either the critical nature of the claimed thicknesses or any unexpected results arising therefrom. Where patentability is said to be based upon particular chosen thicknesses or upon another variable recited in a claim, the Applicant must show that the chosen thicknesses are critical. *In re Woodruf*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

3. In re claim 2, Wang teaches further including the step of forming a glass layer in contact with the barrier layer (30) of the composite insulating structure.

4. In re claims 3, 37 and 54, Wang teaches wherein the glass layer is a doped glass film (column 5).

5. In re claims 4, 38 and 55, Wang teaches wherein the doped glass film includes BPSG material (column 5).

6. In re claims 5, 39 and 56, Wang teaches wherein the doped glass includes PSG material (column 5).

7. In re claims 6, 7, 22, 23, 41 and 42, Wang in view of Yamazaki does not teach wherein the oxide layer is grown at a temperature of about 300 – 900°C.

However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to grow the oxide layer at a temperature of about 300 – 900°C since temperature is a very well known process variable and determining the optimum or workable ranges requires only routine experimentation by someone of ordinary skill in the art. Note that the specification contains no disclosure of either the critical nature of the claimed temperature or any unexpected results arising therefrom. Where patentability is said to be based upon particular chosen temperature or upon another process variable recited in a claim, the Applicant must show that the chosen temperature range is critical. *In re Woodruf*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

8. In re claims 8, 24 and 43, Wang in view of Mizuhara does not show wherein the oxide layer is grown for about 1 second to about 10 minutes.

However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to grow the oxide layer from about 1 second to about 10 minutes since time of oxidation is a very well-known process variable and determining the optimum or workable ranges requires only routine experimentation by someone of ordinary skill in the art. Note that the specification contains no disclosure of either the critical nature of the claimed time or any unexpected results arising therefrom. Where patentability is said to be based upon

particular chosen time or upon another variable recited in a claim, the Applicant must show that the chosen time range is critical. *In re Woodruf*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

Wang in view of Yamazaki teaches wherein the oxygen is supplied by an ozone source (column 12).

9. In re claims 11, 27 and 46 Wang in view of Yamazaki teaches wherein the atomic oxygen is supplied by a plasma source (column 12).

10. In re claims 13, 29 and 48 Wang in view of Yamazaki teaches wherein the atomic oxygen is supplied by photoexcitation (column 12).

11. In re claims 14 and 30, Wang in view of Yamazaki teaches wherein the oxide layer is formed in a batch furnace system (column 12).

12. In re claims 17, 33 and 51 Wang teaches wherein the barrier layer is formed of an insulating material selected from the group consisting of silicon nitride, silicon oxide, silicon dioxide, silicon carbide and high temperature polymers (column 5).

13. In re claims 20 and 36, Wang teaches wherein the oxide layer and the barrier layer are further formed over the gate stack, the gate stack including several of spacers formed on sidewalls of the gate stack structure (figure 1).

14. Claims 9, 25 and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang in view of Yamazaki as applied to claims 1 – 8, 11, 13 – 24, 27, 29 – 43, 46 and 48 – 56 above, and further in view of Lands et al. (U. S. patent 3,571,914).

Wang in view of Yamazaki does not disclose wherein the oxygen is supplied by in situ steam generation.

However, Lands in the U. S. patent 3,571,914; figures 1 – 4 and related text discloses as a well known process (i.e. a convenience process) to form an oxide layer by subjecting the device to steam by bubbling oxygen (column 3).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use steam as the source of oxygen in the invention of Wang in view of Yamazaki since oxidizing with steam is a well-known process (i.e. a convenience process) as taught by Land.

15. Claims 12, 28 and 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang in view Yamazaki as applied to claims 1 – 8, 11, 13 – 24, 27, 29 – 43, 46 and 48 – 56 above, and further in view of Kirimura et al. (U. S. patent 6,383,896 B1).

Wang in view of Yamazaki does not show wherein the oxygen is supplied by a microwave source.

However, Kirimura in the U. S. patent 6,383,896 B1; figures 1 – 4 discloses that forming an oxide with plasma CVD or microwave CVD are art recognized equivalents (column 2).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made wherein the atomic oxygen is supplied by a microwave source as taught by Kirimura in the invention of Wang in view of Yamazaki since Kirimura teaches that plasma and microwave CVD are art recognized equivalents.

Response to Arguments

16. Applicant's arguments filed 12 March 2004 have been fully considered but they are not persuasive for the following reasons.

17. Applicant contests that neither Wang nor Yamazaki discloses the thickness of the oxide layer being 50 to 100 Å.

Examiner agrees that neither Wang nor Yamazaki teach the aforementioned thickness range. However, as explained above, the thickness of a layer, absent to evidence of the contrary, is a well known process variable and is only a matter of routine experimentation to find the workable or optimum ranges. Applicant has not shown that the claimed thickness range is critical. Therefore, the 35 USC §103 rejection stands and it is considered proper.

18. Applicant also contests that the reference of Wang and Yamazaki cannot be combined.

Examiner respectfully submits, that one of ordinary skill in the art would have been motivated to look at alternative suitable methods of performing the disclosed formation of layer 22 of Wang and art recognized suitability for an intended purpose has been recognized to be motivation to combine. See MPEP §2144.07.

19. Applicant also contests that the application of the inherency doctrine in the Office Action to establish a *prima facie* case of obviousness is deficient.

Examiner respectfully submits that in the entire Office Action there is no evidence of using the inherency doctrine to establish obviousness. The rejections carried out in the Office Action are under 35 USC §103 and thus the use of the inherency doctrine to establish obviousness would have been improper.

Conclusion

20. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Fernando L. Toledo whose telephone number is 571-272-1867 or 571-272-1867. The examiner can normally be reached on Mon-Thu 7am to 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on 571-272-1855. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

George Fourson
Primary Examiner
Art Unit 2823

FToledo